



恒跃-EthOS天线设计和试验报告

Antenna Design And Test Report

RF:朱工

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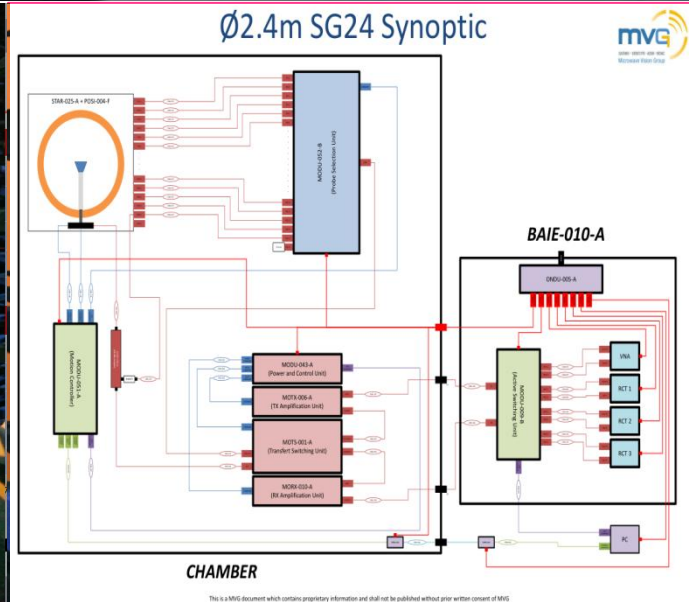
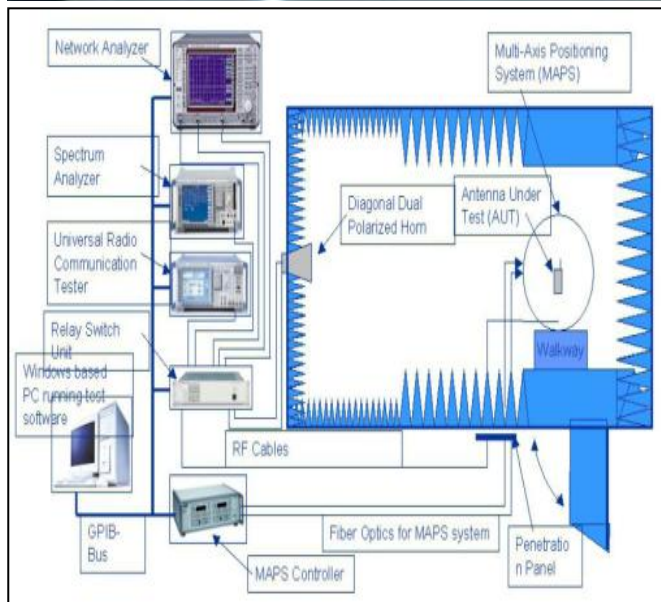
报告日期: 2024年10月25日星期五

项目概述



主天线设计频段: <small>main antenna design spectrum</small>	GSM900/850/1800/1900 WCDMA B1/2/4/5/8 LTE- B1/2/3/4/5/7/8/12/13/20/25/26/28/ 66/71/38/39/40/41
天线类型: <small>Type of antenna</small>	PIFA
副天线设计频段: <small>Deputy antenna design spectrum</small>	WIFI /GPS/BT
天线类型: <small>Type of antenna</small>	PIFA
分集天线频段: <small>Frequency diversity antenna</small>	WCDMA B1/2/4/5/8 LTE- B1/2/3/4/5/7/8/12/13/20/25/26/28/ 66/71/38/39/40/41
天线类型: <small>Type of antenna</small>	PIFA

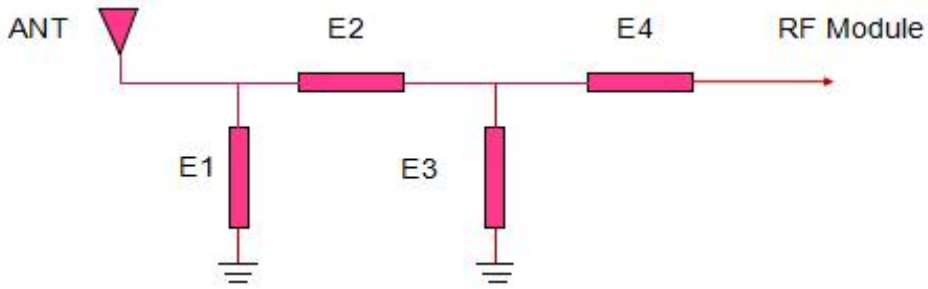
报告版本: <small>Report version</small>	日期 <small>Date</small>	内容 <small>Content</small>
V1.0	2024.10.10	初步调试无源天线设计测试报告
V2.0	2024.10.25	天线无源测试报告



一切为了客户



主天线设计: main antenna design		副天线设计: Deputy antenna design		分集天线设计: Diversity antenna design	
元件 Element	值 Value	元件 Element	值 Value	元件 Element	值 Value
E1(0201):	N/A	E1(0201):	N/A	E1(0201):	12nH
E2(0201):	N/A	E2(0201):	4.7pF	E2(0201):	N/A
E3(0201):	N/A	E3(0201):	N/A	E3(0201):	N/A
E4(0201):	N/A	E4(0201):	N/A	E4(0201):	N/A

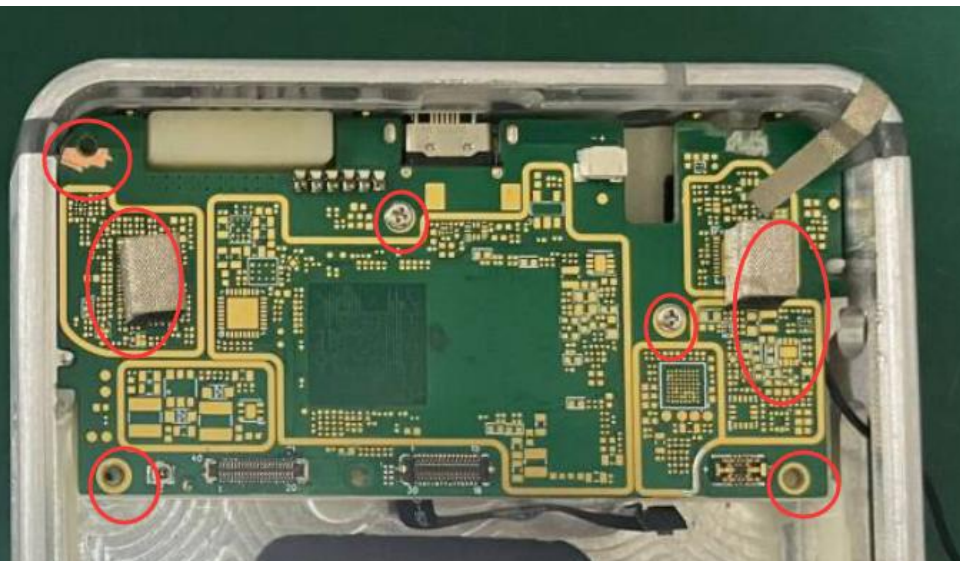
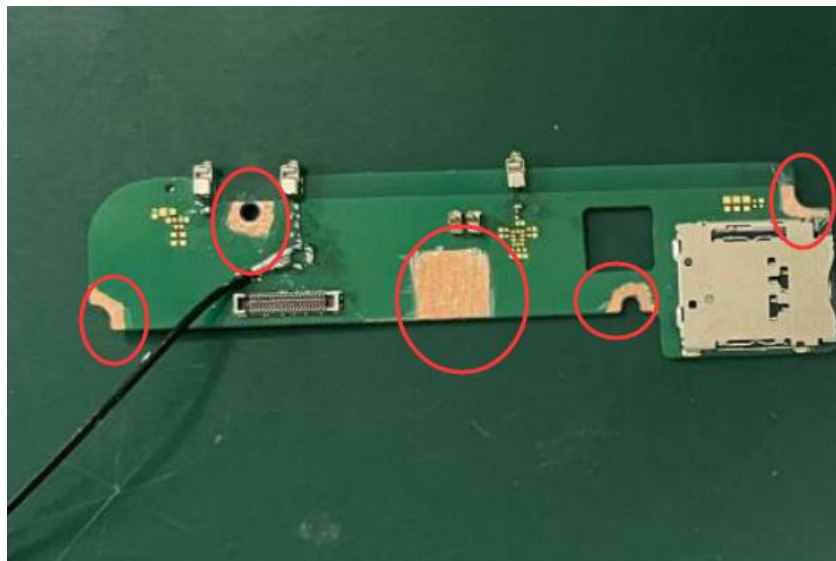


备注：有源机器调试后再定.



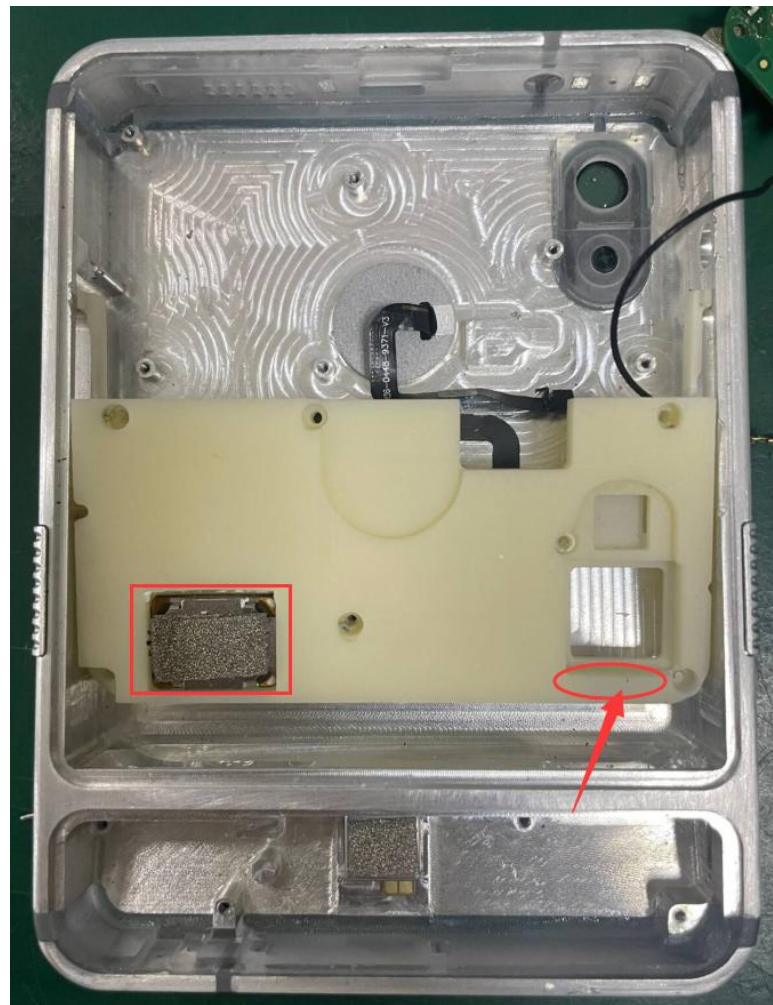
RF开关	匹配	控制频段
RF1		GSM:900/1800/1900 WCDMA:B1/2/4/8 LTE:B1/2/3/4/7/8/25/38/39/40/41/66
RF2		LTE:B12/13/28
RF3		GSM:850 WCDMA:B5 LTE : B5/20/26
RF4		LTE : B71

红色部分区域预留接地，螺丝孔位置预留露铜与金属壳接地。



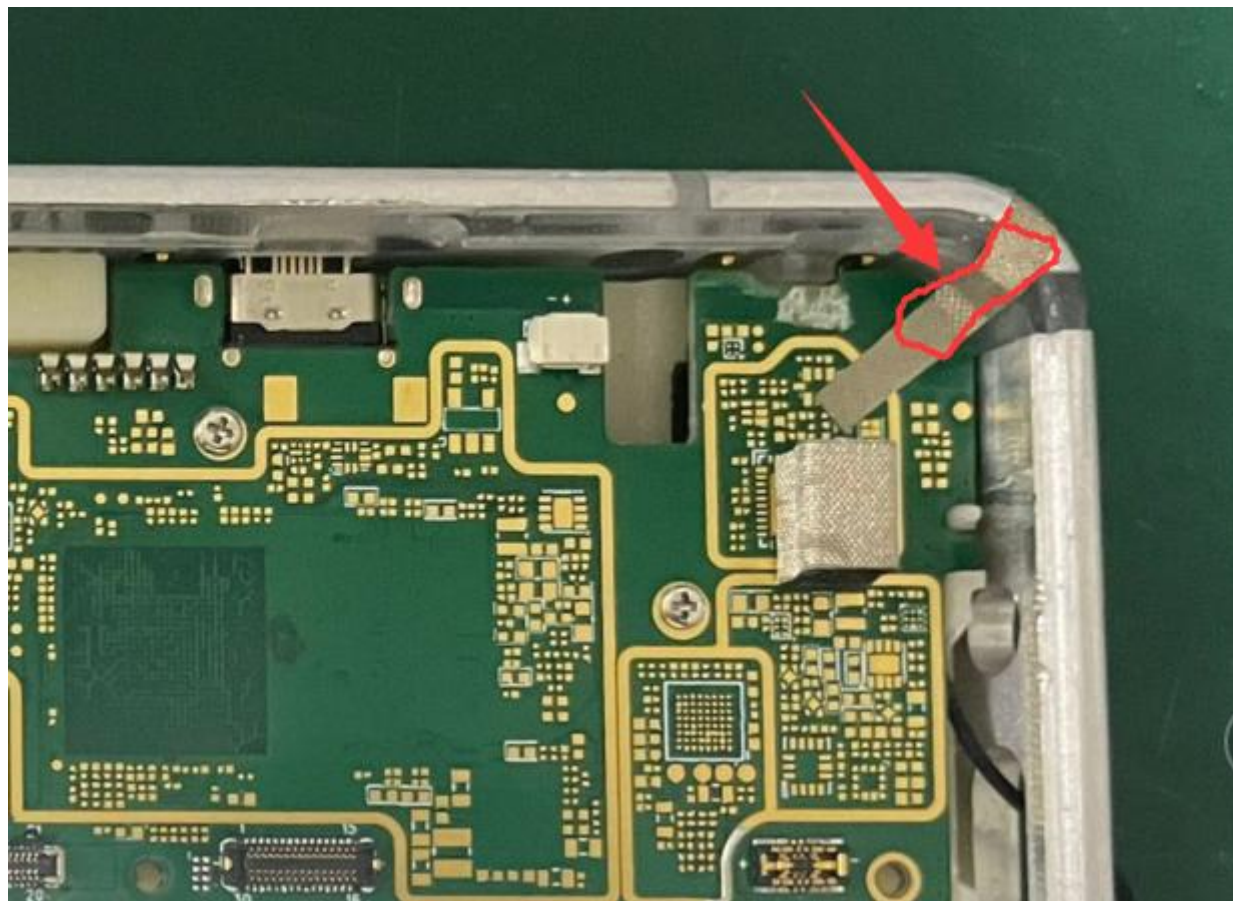


喇叭预留接地，支架红圈位置预留主板与金属接地。





三合一边框金属天线长至螺丝孔位置，主板螺丝孔正反面露铜，对地用0欧姆连接。



4G主集天线

2.7nH					
1			1		
Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dB	
800000000	21.57%	-6.66214	800000000	-0.72553	
816000000	21.80%	-6.61641	816000000	-0.18645	
832000000	26.82%	-5.71505	832000000	0.607815	
848000000	33.16%	-4.79381	848000000	2.120709	
864000000	32.42%	-4.89245	864000000	2.014738	
880000000	33.57%	-4.7408	880000000	1.183868	
896000000	39.06%	-4.08272	896000000	1.824826	
912000000	37.07%	-4.31031	912000000	2.742335	
928000000	35.48%	-4.5004	928000000	2.418497	
944000000	36.83%	-4.33816	944000000	1.584637	
960000000	30.71%	-5.1274	960000000	0.194934	

1			1		
Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dB	
1700000000	26.24%	-5.81	1700000000	-0.16	
1750000000	23.72%	-6.24868	1750000000	-0.72005	
1800000000	26.90%	-5.70291	1800000000	0.060267	
1850000000	31.43%	-5.02607	1850000000	0.919938	
1900000000	32.96%	-4.82031	1900000000	1.149644	
1950000000	34.95%	-4.56546	1950000000	1.275446	
2000000000	29.32%	-5.32766	2000000000	0.364897	
2050000000	27.93%	-5.53918	2050000000	0.450085	
2100000000	28.52%	-5.44797	2100000000	0.879824	
2150000000	27.98%	-5.53186	2150000000	0.7632	
2200000000	27.13%	-5.66625	2200000000	0.11474	
2250000000	25.75%	-5.89191	2250000000	-0.53822	
2300000000	22.60%	-6.45965	2300000000	-0.90282	
2350000000	23.32%	-6.32253	2350000000	0.137591	
2400000000	25.48%	-5.93764	2400000000	0.654739	
2450000000	26.74%	-5.72908	2450000000	0.35487	
2500000000	29.51%	-5.30018	2500000000	-0.12003	
2550000000	28.48%	-5.45509	2550000000	-0.62996	
2600000000	29.68%	-5.27608	2600000000	0.329997	
2650000000	33.22%	-4.78649	2650000000	0.999292	
2700000000	39.13%	-4.07499	2700000000	2.270101	

低频偏B5/8状态

无源效率增益 测量仪器: Agilent Technologies E5071B 300kHz-8.5GHz ENA Series Network Analyzer 暗室系统: MVG SG24LT (Satmio)

4G分集天线

0欧					
1			1		
Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dB	
700000000	4.96%	-13.0421	700000000	-8.83461	
713000000	7.95%	-10.9964	713000000	-7.78493	
726000000	12.96%	-8.87519	726000000	-5.4638	
739000000	12.15%	-9.1552	739000000	-5.6688	
752000000	18.43%	-7.34469	752000000	-3.86255	
765000000	23.33%	-6.32134	765000000	-2.51872	
778000000	21.71%	-6.63306	778000000	-2.67207	
791000000	25.29%	-5.97112	791000000	-1.79756	
804000000	18.65%	-7.29226	804000000	-2.79939	
817000000	14.47%	-8.39639	817000000	-3.00304	
830000000	12.58%	-9.00363	830000000	-3.69269	
843000000	9.27%	-10.3272	843000000	-4.1153	
856000000	8.76%	-10.5747	856000000	-3.62998	
869000000	8.28%	-10.8171	869000000	-4.79414	
882000000	7.90%	-11.0264	882000000	-4.47095	
895000000	9.19%	-10.3658	895000000	-3.9957	
908000000	9.94%	-10.0252	908000000	-4.31022	
921000000	11.16%	-9.52283	921000000	-3.21316	
934000000	12.87%	-8.90423	934000000	-2.87293	
947000000	12.18%	-9.14406	947000000	-3.4691	
960000000	12.27%	-9.11009	960000000	-3.57815	

NC					
1			1		
Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dB	
800000000	8.01%	-10.9655	800000000	-5.8329	
820000000	7.54%	-11.2266	820000000	-5.2331	
840000000	7.16%	-11.4497	840000000	-5.2886	
860000000	7.51%	-11.2425	860000000	-4.9609	
880000000	8.92%	-10.494	880000000	-4.1520	
900000000	11.38%	-9.43674	900000000	-3.0148	
920000000	15.87%	-7.99328	920000000	-1.1502	
940000000	19.06%	-7.1992	940000000	-0.219	
960000000	18.23%	-7.39119	960000000	-1.2732	
980000000	20.52%	-6.87876	980000000	-0.9065	
1E+09	22.63%	-6.45289	1E+09	0.02411	

1			1		
Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dB	
1700000000	13.73%	-8.62304	1700000000	-2.87396	
1750000000	14.51%	-8.38338	1750000000	-1.40663	
1800000000	14.76%	-8.30846	1800000000	-1.06606	
1850000000	15.64%	-8.0571	1850000000	-1.87387	
1900000000	13.39%	-8.73156	1900000000	-3.79768	
1950000000	13.45%	-8.71211	1950000000	-4.05464	
2000000000	11.36%	-9.44605	2000000000	-3.63068	
2050000000	11.42%	-9.42252	2050000000	-2.8746	
2100000000	13.34%	-8.7484	2100000000	-2.1673	
2150000000	12.15%	-9.15394	2150000000	-2.95051	
2200000000	13.64%	-8.65282	2200000000	-2.05475	
2250000000	19.42%	-7.11743	2250000000	-1.10816	
2300000000	21.66%	-6.6433	2300000000	-0.19515	
2350000000	23.37%	-6.31273	2350000000	0.80803	
2400000000	24.34%	-6.1365	2400000000	0.587625	
2450000000	21.21%	-6.73433	2450000000	0.658178	
2500000000	19.11%	-7.18772	2500000000	-0.77731	
2550000000	18.90%	-7.23449	2550000000	-1.55523	
2600000000	17.90%	-7.47242	2600000000	-2.32548	
2650000000	12.06%	-9.18699	2650000000	-3.29847	
2700000000	8.32%	-10.7981	2700000000	-6.00664	

无源效率增益 测量仪器: Agilent Technologies E5071B 300kHz-8.5GHz ENA Series Network Analyzer 暗室系统: MVG SG24LT (Satmio)

GPS/WIFI/BT天线

1			1	
Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dB
2400000000	16.06%	-7.942526361	2400000000	-0.891943541
2410000000	16.25%	-7.89240752	2410000000	-0.734775669
2420000000	16.05%	-7.944161581	2420000000	-0.744798722
2430000000	16.60%	-7.79907291	2430000000	-0.654177756
2440000000	17.11%	-7.668732668	2440000000	-0.537794052
2450000000	17.06%	-7.681050789	2450000000	-0.610625776
2460000000	17.20%	-7.643708662	2460000000	-0.788397054
2470000000	17.14%	-7.661102761	2470000000	-0.823355074
2480000000	16.72%	-7.768078487	2480000000	-0.673536673
2490000000	15.98%	-7.964681497	2490000000	-0.814651741
2500000000	15.75%	-8.027634363	2500000000	-0.986298291
1			1	
Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dB
1570000000	37.99%	-4.202841675	1570000000	-0.124693795
1571000000	37.92%	-4.211306427	1571000000	-0.162536558
1572000000	37.78%	-4.227571787	1572000000	-0.230740801
1573000000	37.56%	-4.2531693	1573000000	-0.181003057
1574000000	37.35%	-4.277642354	1574000000	-0.116806311
1575000000	37.22%	-4.292480147	1575000000	-0.039686637
1576000000	37.21%	-4.293811853	1576000000	0.018266809
1577000000	37.29%	-4.283653199	1577000000	0.073173776
1578000000	37.42%	-4.269418974	1578000000	0.090254071
1579000000	37.47%	-4.263260613	1579000000	0.093432798
1580000000	37.32%	-4.280035699	1580000000	0.086705405

1			1	
Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dB
5120000000	11.50%	-9.392176591	5120000000	-2.206432384
5155000000	10.93%	-9.613303378	5155000000	-3.067433371
5190000000	12.23%	-9.127169436	5190000000	-2.256818261
5225000000	13.06%	-8.840106357	5225000000	-1.079549375
5260000000	13.62%	-8.657649043	5260000000	-0.527651482
5295000000	14.11%	-8.504535147	5295000000	0.158062436
5330000000	14.09%	-8.511970338	5330000000	0.038553279
5365000000	15.84%	-8.002574051	5365000000	0.30061726
5400000000	18.64%	-7.296028529	5400000000	0.945882536
5435000000	20.96%	-6.785983075	5435000000	1.324056373
5470000000	21.31%	-6.713257773	5470000000	1.358702648
5505000000	20.40%	-6.90445641	5505000000	0.90041123
5540000000	19.27%	-7.151706477	5540000000	0.847997623
5575000000	16.91%	-7.718717014	5575000000	-0.155062244
5610000000	14.46%	-8.398199419	5610000000	-0.901562444
5645000000	12.48%	-9.038078731	5645000000	-1.423246293
5680000000	11.74%	-9.304268339	5680000000	-2.308966022
5715000000	10.68%	-9.714041821	5715000000	-3.014224499
5750000000	11.00%	-9.585430228	5750000000	-2.879663728
5785000000	11.05%	-9.564469472	5785000000	-2.44260547
5820000000	11.46%	-9.40932156	5820000000	-2.119247858

无源效率增益 测量仪器: Agilent Technologies E5071B 300kHz-8.5GHz ENA Series Network Analyzer 暗室系统: MVG SG24LT (Satmio)



- 1.以上是初步调试天线无源测试报告。三合一金属天线结构建议作出优化调整。
- 2.主板、小板螺丝孔位置需与金属壳接地，**PCB**正反面预留露铜接地。
- 3.如有疑问，请电话联系。



01

报告中天线匹配电路是否改动，天线有关的环境处理是否增加，将直接影响天线性能，请仔细确认查看。

02

贵司如有最新试产或更新产品（如软件，**ESD**，物料等）请尽快提供我司进行验证，以确认天线性能是否有变化影响。

03

倘若贵司需要送第三方检测机构复测或客户测试，请务必先与我司进行天线相关测试确认，因主板·装配的一致性，以及天线组装的差异等因素，均可能导致天线参数的偏差。

谢谢

THANK YOU

如有疑问 请联系我们

日常服务时间：周一至周五 9:00-18:00

总机热线：0755-36615535 销售热线：0755-36615535 传真：0755-82916227

 网址：www.mayaant.com